

Gravity field Maxwell Equations .

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Part 1. It is possible to complete Maxwell Equations for Electromagnetic field with differential equations for gravitational field:

$$\begin{aligned} \text{curl } \mathbf{g} &= 0 \\ \text{div } \mathbf{g} &= -4\pi G \left(\rho + \frac{p}{c^2} \right) - \frac{G}{2c^2} (\mathbf{E}^2 + \mathbf{H}^2) - \frac{\mathbf{g}^2}{2c^2} \end{aligned}$$

The first equation reflects the fact, that gravity waves are still not found in the nature. The second equation describes sources of gravity field: these are usual substance with density ρ , electromagnetic field with intensity $\mathbf{E}$ and $\mathbf{H}$, and also gravitational field with

intensity $\mathbf{g}$, ($\mathbf{g}$ - has dimension of acceleration), p - is pressure. Nobody before has paid the attention, that gravity field, can be a source of gravitation, as well as any kind of stuff. G - is the Newton constant. c - speed of light.

Part 2. Gravity field energy density .

From the second equation we find expression for Gravity field energy density :

$$W = - \frac{\mathbf{g}^2}{8\pi G}$$

It is unexpected, that gravity constant G is in a denominator in this expression. So for gravitational field at a surface of the Earth for $g = 9.81 \text{ m/sec}^2$, we find : $W \sim - 10^{11} \text{ Joul/m}^3$.

The “-“ sign in this expression shows, that Gravity field energy density is negative as well, as appropriate Gravity interaction energy. This way Gravity field may be regarded as some “substance” with positive density and negative pressure.

Part 3. Newton law improved

It is not difficult to result the formula for the Newton law improved, taking into account that gravity field is also a source of gravitation:

$$\mathbf{g} = - \frac{\text{GMR}}{R^3 \left(1 - \frac{GM}{2c^2} \left(\frac{1}{R_0} - \frac{1}{R} \right) \right)}$$

M - mass of a body, R_0 - radius of a body.

At large distance, according to this , gravity field results larger, compare to it traditional value. Qualitative analysis of this expression shows also , that some " repellent force ", at interaction of two masses is appearing at low distances.

In our opinion this formula can explain, for example, why the space vehicle " Pioneer - 10 ", NASA, that is outside the Solar system now, is slowed down faster, than it follows from calculations. “Relkom.ru” journal writes in this occasion: "Movement of the “Pioneer 10 ” in space is interested for the scientists, as it was found , that it is impossible to explain its observed slowing by only one gravitational attraction of Solar system. It can serve as the certificate of existence of force, still unknown to science, or is connected to some properties of the space vehicle.”

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